

### REMARKS

Applicant has carefully reviewed and considered the Office Action mailed on July 27, 2006, and the references cited therewith.

Claims 1-2, 5-7, 9-10, 12-14, 16-19 are amended, claims 3-4, 8, 11, and 15 are canceled. As a result, claims 1-2, 5-7, 9-10, 12-14, and 16-21 are now pending in this application.

Specifically, claim 1 is amended to include all the limitations of claim 4, now canceled, and to overcome the Examiner's rejection under 35 USC § 101. Claim 7 is amended to include all the limitations of claim 8, now canceled, and to overcome the Examiner's rejection under 35 USC § 101. Claim 14 is amended to include all the limitations in claim 15, now canceled. Claims 5-6, 9-10, 12-13, and 16-19 have been amended, respectively, to change their dependency and/or to better define the subject matter claimed.

It is submitted that support for amended claims 1-2, 5-7, 9-10, 12-14, 16-19 is found in the application as originally filed, including the originally filed claims. For example for amended claim 1, paragraphs 0026-0029 of the present patent application describe that the system includes a computer-based execution system (e.g., personal computer, personal digital assistant, etc.) and a runtime system hosted by (i.e., stored in and run on) the execution system. For amended claim 7, paragraph 0040 of the present patent application describes the operation/method performed by the runtime system 20 hosted by the computer-based execution system. Thus, the method claimed in amended claim 7 is a computer-implemented method. It is submitted that amended claims 1-2, 5-7, 9-10, 12-14, 16-19 do not add new matter.

### § 101 Rejection of the Claims

Claims 1-3, 7, 11-14 and 21 were rejected under 35 USC § 101 because the claimed invention is directed to non-statutory subject matter. The claims fail to provide a practical application in that they are abstract and not tangible. For example, claim 1 merely recites "determining", "analyzing", "allocating" and "recover", all of which are abstract concepts.

Claims 1-6 were rejected under 35 U.S. § 101 because the claimed invention is directed to non-statutory subject matter. The claims are directed toward software per se, as there is no actual hardware implementation.

As stated above, claims 1-2, 5-7, 9-10, 12-14, 16-19 have been amended, claims 3-4, 8, 11, and 15 have been canceled. It is submitted that claims 1-2, 5-7, 9-10, 12-14, and 16-21, as amended, are patentable under 35 U.S. § 101 for the following reasons.

With respect to the Examiner's rejection that claim 1 merely recites abstract concepts, it is submitted that amended claim 1 includes physical modules that perform physical and tangible operations. For example, paragraph 0029 of the present patent application describes various forms of implementing the modules. In addition, the escape analysis module determines which objects of a software program can be stack allocated under a closed-world assumption and analyzes which stack allocation is invalidated due to an occurrence of an open-world feature (Emphasis Added). The stack allocation module stack-allocates the objects determined by the escape analysis module and the stack allocation recovery module recovers invalidated stack allocations based on the analysis performed by the escape analysis module. These are all concrete, physical and tangible operations during compilation of the software program into native (i.e., machine) code (Emphasis Added). The specification of the present patent application describes these operations in sufficient and enabling details. For example, paragraphs 0035-0036 (as well as in Fig. 6 and its accompanying description) of the present patent application describe the stack-allocation operation. Paragraphs 0037-0038 of the present patent application describe the escape analysis operation. Paragraph 0039 (as well as in Figs. 4-5 and their accompanying description) of the present patent application describe the stack allocation recovery operation.

With respect to the Examiner's rejection that claim 1 is directed toward software per se which the Examiner claims to be non-statutory subject matter, it is submitted that amended claim 1 overcomes the Examiner's rejection in that amended claim 1 is directed toward a system that includes "a computer-based execution system" and "a runtime system stored in and run on the computer-based execution system" (amended claim 1).

Given that amended claim 2 depends from amended claim 1, it is submitted that amended claim 2 is also patentable under 35 U.S. § 101.

With respect to the Examiner's rejection that claim 7 merely recites abstract concepts, it is submitted that claim 7 has been amended to be a "computer-implemented method". In addition, it is submitted that amended claim 7 recites physical and tangible operations. For

example, the determining operation is to determine which objects of a software program can be stack allocated and to analyze which stack allocation is invalidated (Emphasis Added). The stack-allocating operation stack-allocates the objects based on the determination, and the recovering operation recovers invalidated stack allocations based on the analysis. These are all concrete, physical and tangible operations during compilation of the software program into native (i.e., machine) code (Emphasis Added). The description of the present patent application described these operations in sufficient and enabling details. For example, paragraphs 0035-0036 (as well as in Fig. 6 and its accompanying description) of the present patent application describe the stack-allocation operation. Paragraphs 0037-0038 of the present patent application describe the escape analysis operation. Paragraph 0039 (as well as in Figs. 4-5 and their accompanying description) of the present patent application describe the stack allocation recovery operation.

Given that amended claims 12-13 depend from amended claim 7, it is submitted that these amended claims are also patentable under 35 U.S. § 101.

Likewise, it is submitted that claims 14 and 21, as amended, are also patentable under 35 U.S. § 101 for reasons stated above with respect to amended claims 7 and 12-13.

In view of the above-stated amendment to claims and arguments, it is submitted that claims 1-2, 7, 12-14, and 21, as amended, are patentable under 35 U.S. § 101. Claims 5-6, 9-10, and 15-20, as amended, are not rejected under 35 U.S. § 101.

#### §102 Rejection of the Claims and Allowable Subject Matter

Claims 1-3, 7, 11-14 and 18-21 were rejected under 35 USC § 102(e) as being anticipated by *Schmidt* (U.S. Publication 2004/0015920). In particular, the Examiner stated in part that

##### Claim 1

**Schmidt** disclosed a system, comprising:

an escape analysis module to (1) determine which objects of a program can be stack allocated under a closed-world assumption (*page 2, paragraph 0013, "one or more of its methods may create objects that may be placed on the method's invocation stack" and "During the compilation of the class, only the information relating to the previously-loaded classes is taken into account", emphasis added; page 6, paragraph 0092,*

*“performs escape analysis to determine whether to allocate an object on an invocation stack or on the heap based on the available information”; closed world) and (2) analyze which stack allocation is invalidated due to an occurrence of an open-world feature (page 2, paragraph 0013, “dynamically compiled” and “After compilation, as each new class loaded, the class is analyzed to see if loading the class might change the analysis used to allocate object on the invocation stacks of previously-compiled methods”, emphasis added to demonstrate “open-world”);*

*a stack allocation module to stack allocate the objects determined by the escape analysis module (page 2, paragraph 0013, “one or more of its methods may create objects that may be placed on the method’s invocation stack”); and*

*a stack allocation recovery module to recover invalidated stack allocations back to their original allocations in heap based on the analysis of the escape analysis module (page 6, paragraph 0092, last two sentences).*

(07/27/06 Office Action, pages 3-4).

Claims 4-6, 8-9 and 15-17 were objected to as being dependent upon a rejected base claim, but were indicated to be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Additionally, the Examiner has indicated that claims 4-6 require correction of a 101 non-statutory issue.

As stated above, claims 1-2, 5-7, 9-10, 12-14, 16-19 have been amended, claims 3-4, 8, 11, and 15 have been canceled. Specifically, claim 1 has been amended to include all the limitations of claim 4, now canceled. Claim 7 is amended to include all the limitations of claim 8, now canceled. Claim 14 is amended to include all the limitations in claim 15, now canceled. Claims 2, 5-6, 9-10, 12-13, and 16-19 have been amended, respectively, to change their dependency and/or to better define the subject matter claimed. It is submitted that claims 1-2, 5-7, 9-10, 12-14, and 16-21, as amended, are patentable under 35 U.S. § 102(e) in view of *Schmidt*.

In view of the above, it is submitted that the Examiner’s rejections under 35 U.S. § 102(e) in view of *Schmidt* and objections have been overcome.

Conclusion

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney (217-377-2500) to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 50-1624.

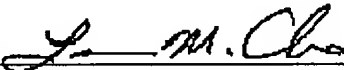
Respectfully submitted,

GANSHA WU ET AL.

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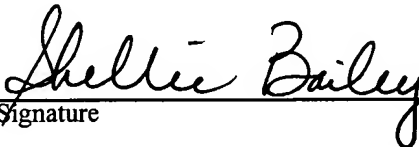
Date: October 17, 2006

By 

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Mail Stop Amendment, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 17th day of October, 2006.

Shellie Bailey

  
Signature